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CATTLE PRACTICE.

We believe it is a fact that veterinary surgeons in Ireland do comparatively little cattle practice. Why this is so we are not certain. The practitioners say that owners of cattle do not give them the opportunity to afford assistance, that stock-owners fancy veterinarians prefer horse-practice and are really not expert in the treatment of cattle.

The Farmers Gazette, commenting on the recent meeting of the National Veterinary Association in Dublin, is struck with "the great prominence accorded in all the debates and discussions to the horse and equine matters, and the correspondingly small share of attention devoted to questions bearing upon the welfare of the other animals of the farm." We hardly agree with our contemporary. The first discussion was on "Diseases Communicable by Food or Contact from Animals to man." In this the horse certainly did not occupy much space. Cattle were chiefly implicated, and pigs, sheep, fowls, and dogs were all included. The second discussion was on "Veterinary Hospital Nursing" and certainly related more to the horse than other animals. The third subject of debate was "Cross-breeding in Animals" and was directed to all kinds of stock. The fourth and last subject discussed was "Surgical and Mechanical Appliances." Here the horse naturally occupied most attention because cattle, sheep, and pigs are seldom the subjects of operative surgery. We incline to think that the meeting of the Veterinary Association gave fair comparative attention to all the domestic animals. To the scientific man all cases are interesting whether in the horse, cow or pig. The practitioner and the stock-owner have another interest in sick animals which cannot be lost sight of—a pecuniary one. The time and skill required to attend a sheep is the same as would be devoted to a high-class hunter, but the owner would hardly care to pay the same for both cases. The veterinarian might be usefully employed, not so often perhaps when individuals among the smaller and cheaper domestic animals are injured or sick, but when outbreaks occur affecting numbers. When the stock consists of valuable pedigree animals it is certainly worth sending for the veterinary practitioner, and in few cases—even when the horse is his most frequent patient—would his services not be a great improvement upon those of a knowing neighbour or an experienced cowman. The training of a veterinary surgeon includes the principles of treatment of disease in all animals. He starts with a knowledge of the subject possessed by no other class, and only requires the experience supplied by practice to soon become an expert. Without practice he cannot progress, and in time his diagnosis becomes less acute.

The New Veterinary College in Ireland will doubtless supply its graduates with all the information possible by lectures and demonstrations. It will turn out men possessing a good grasp of the principles of medicine and surgery applicable to disease and injury in horses, cattle, sheep, pigs, and dogs. There is a Veterinary Science and there is a Veterinary Art. Experience is necessary to enable a man to master any art, and the stockowners of Ireland must make the first move by affording the young man opportunity to put in practice the principles he has learned. Veterinary surgeons are human, and must live. They naturally take what is easiest and nearest. The owners of horses recognise that veterinarians do understand the equine patient. They wrongly assume that he does not understand the ailments of other stock.

Our contemporary asserts that "for years it has been a subject of general complaint among Irish stockowners that veterinary surgeons devote too much attention to the horse and too little to cattle, sheep, and pigs, with the result that when one of them, who may be an authority on equine ailments, is called on to deal with a case of sickness in any other farm animal he very often proves of but little more assistance than an ordinary intelligent but quite unlearned cattleman."

This is rather too sweeping. Unless a practitioner had forgotten all he was taught and was destitute of common intelligence he could not know as little as the unlearned cattleman. The opinion "among Irish stockowners" that veterinary practitioners are not worth employing for cattle cases is probably due to the fact that skilled assistance is sought only after such a loss of time and such a dosing with home-made medicines as to leave no chance of successful battling with disease.

College training alone never made a good practitioner—practice is essential. If the stock-owner thinks his cattleman or shepherd as good as the veterinarian, how is practice to be obtained?

To the veterinary surgeon all cases in all animals are interesting. His interest in horses is not greater than his interest in cattle, provided his remuneration and recognition is the same for similar work on both animals.

Mutual confidence between practitioner and stockowner is what is wanted. It is an illogical position to demand that a man shall not go into the water until he can swim.

ARMY HORSES.

A superficial little note we recently penned was prompted by the hope that some of the veterinary officers in South Africa might find time to give us a few facts. Pending their action we have reprinted from *The Daily Telegraph* the best article we have yet read on the subject.

No other paper during this war has been supplied with such sound knowledgeable articles on horses as the Telegraph. The writer is clearly a horseman with a grasp of his subject. Have we learned now what sort of horses will be required and where we must go to find them? Can we enlarge our Registration Scheme? Can we breed more at home, or will our colonies meet the demand?

CASES AND ARTICLES.

LAPAROTOMY AS AN AID TO DIAGNOSIS.

By Fredk. Hobday, F.R.C.V.S., Kensington.

The article translated from the German by Mr. G. Mayall and published in last week's *Veterinary Record*, is of the greatest interest. The operation of laparotomy is one which ought to be practised much more frequently in obscure abdominal affections and where diseased conditions of the abdominal organs are suspected. Certainly in the smaller animals and in fowls it is an operation which can be performed almost with impunity if only proper measures to secure and anæsthetise the patient are taken, and strict attention is paid to the principles of antiseptic surgery. With the larger animals, it is generally thought that the peritoneum of the horse is more sensitive than that of the ox tribe, but the chief trouble up to the present has been the want of a good operating table upon which such a cumbersome animal could be dealt with without running any great risk of infection at the time of operation.

The undermentioned is a list of animals in which I have had occasion to open the abdomen during the past five years either in the College clinique, or in the country after consultation with practitioners; some were done purely for diagnostic purposes, but the majority during the course of some operation or other:

Horses or Mares. 26 cases. These include laparotomies for obstruction of the intestine, abdominal cryptorchids, ovariotomy, radical operation for umbilical and abdominal hernia.

Cattle. 25 cases. These include ovariotomy and rumenotomy.

Dogs and Cats. More than 200 cases. These include oöphorectomy, ovariotomy, ovaro-hysterectomy, cæsarean section, radical operation for hernia, enterotomy, gastrotomy, supra-pubic lithotomy etc.

Monkey. One case of oöphorectomy.

Pigs. A number of cases of oöphorectomy.

As regards the results of effecting an entrance into the abdomen the chief sequel which has always been dreaded by the surgeon in the past has been peritonitis, and it is this complication which has been almost entirely abolished by the introduction of antiseptic principles into surgery. To avoid it surgical cleanliness is essential, and although animal patients cannot be placed amongst such advantageous surroundings as human patients, yet if even only ordinary precautions are taken peritonitis becomes a very rare factor.

Out of the above mentioned cases only five animals succumbed to this cause, and the source of infection was satisfactorily traced in each instance.

Other accidents which may occur are those of excessive hæmorrhage, prolapse of the bowels, and death from exhaustion. The first-named is guarded against by a judicious selection of the site for incision and the use of pressure forceps. Prolapse of the bowels rarely occurs unless due to over-feeding or to some violent movement on the part of the patient; to guard against it the meals should be small and given more frequently than usual, and the animal should be kept quiet for about ten days or a fortnight after the operation. Death from exhaustion depends generally upon the condition of the patient and also to a certain extent upon the length and severity of the operation.

The principles which lead to successful results in the surgery of animals include the thorough application of soap and hot water to both operator and patient, the removal of hair from and around the site of incision with scissors and razor, the scrubbing of the skin with some reliable antiseptic, then with ether or some such solvent to remove grease, and lastly with some antiseptic again. Everything which is coming in contact with the wound should be sterilised as far as possible, the instruments being boiled for this purpose, and the operator's hands thoroughly scrubbed and soaked in disinfectant.

The operator himself should not, after having prepared his hands, touch any non-sterilised body until he has finished operating. The wound is carefully sutured in layers with sterilised silk or silkworm gut, and the whole hermetically sealed by being covered with some flexible antiseptic gelatine or such material as iodoform (or orthoform) and collodion. As a rule the wound gives no further cause for anxiety, and the stitches are removed in about ten days. If no septic infection results afterwards or has been introduced at the time of operating, the patient never attempts to touch the wound; that pus in a wound is the cause of irritation and one of the chief reasons why animals continually lick or try to rub the wounded part is a point that I have observed and experimentally proved several times.

Now that laparotomy can be performed practically with safety it will undoubtedly be resorted to more and more as an aid to diagnosis. If, upon examination, the result of the abdominal contents showed an incurable state of affairs the patient could always be destroyed under the anæsthetic, and thus on humane grounds the operation is one that commends itself.

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On the Dog Plague or New Dog Disease.—By Veterinary Surgeon Richter, of Dessau.

(Continued from page 130.)

Pathogenesis.—Three German authors agree that the disease results from a virus conveyed to the blood in whatever way it may be. The products of this virus or its accumulation in the blood cause those changes in the power of the heart which Albrecht has noticed and which he ascribes to a direct or secondary irritation of the nervous system, for the feebleness of this organ is apparent even where the dog is well nourished and there is no falling away in condition. Nor has the nourishment in the body become absorbed, for where the stomach is empty it is due to retching and vomition. Klett asserts that the disease producing agent at first takes up its position in the stomach and intestine and from thence it infects the blood causing destruction of nerve tissue and bringing about a soporific or pseudo-paretic condition.

Scheibel found a bacterium, and questions whether when this affects the body it does not produce

changes resulting in the disease under notice. There were variations in the symptoms of the illness as noticed at Frankfort, Munich, and Stuttgart. Fever was not constant. Death in some cases seemed to result from nervous derangement, and in others from inflammation of the stomach and intestines. Whilst in Frankfort, Munich and Stuttgart gastro-enteritis hæmorrhagica was prevalent, in Dessau nervous spasms and paralysis were mostly in evidence. Lesions in the mouth were considered specific when they occurred.

Veterinary Surgeon Pirl grew cultures on agar and gelatine from the blood of the spleen and heart. The cultures from the heart blood grew the best. Pirl has succeeded in isolating a small bacterium similar to the bacterium hæmorrhagicum. — *Berliner Thierärzt Woch.* G. M.

ABNORMAL GROWTH ON A PUPPY.

By A. S. Hodgkins, c/o Alfred Hodgkins, M.R.C.V.S. Hanley, Staffs.

The dam of the photo, a pure bred, wire-haired fox terrier, was served by noted stud dog. She had six puppies late on the evening of September 1st, was fed with milk etc., and when I came to see what luck I had, was surprised to find something wrong with one of them. On picking the puppy up to examine him, I found him still alive, and he lived on for 24 hours, when I gave him his quietus. The lower part was joined to the navel of the fully grown pup, it has two fully developed feet, and would have been, had nature taken its proper course, a dog puppy. I am indebted to Mr. W. H. Bentley, Hanley, for the photograph.

EXTRACTS AND NOTES.

THE VETERINARY PROFESSION AND THE GOVERNMENT.

At the annual Conference of the National Veterinary Association, held at Dublin, there was some plain and pointed speaking as to the injudicious and unsatisfactory way in which the veterinary profession has been treated by each successive Government of recent years. The President of the Association put forward a strong and unanswerable plea for adequate recognition of the claims of the veterinary profession at the hands of the Government, and several subsequent speakers emphasised these claims in a very forcible way. The first claim put forward on behalf of the profession was that the army veterinary surgeon should have a status proportioned to the importance of his services, and that the Army Veterinary Department should be more fully manned. It is very easy to see the force of this claim in the light of recent events. The great war in South Africa has given the War Office and the country some very valuable, but very costly, lessons, one of the lessons thus enforced being the paramount importance of mounted troops. When the war began, and the Australian Colonies offered assistance, the Imperial Government intimated that unmounted troops would be preferred; but by the close of the fateful week which witnessed the disasters at Stormberg, Maggersfontein, and Colenso, the Government had fully learned the paramount importance of mounted troops, and then they gladly accepted the services of Imperial Yeomen, mounted Bushmen, Strathcona's Horse, and the Highland Ghillie Corps, &c. Hence the importance also of the services rendered by the army veterinary surgeon who is charged with the duty of keeping the horses "fit," and guarding against the introduction and spread of contagious disease among the "mounts." Only last week it was found that the chief remount depôt at Woolwich, which is under military control—and is not under the control of the Army Veterinary Department—was found to be a perfect hotbed of mange, so that all the horses there have had to be condemned, and a fresh depôt has to be established. Truly, therefore, in view of the fuller recognition of the value of mounted troops, the veterinary profession is fully warranted, and indeed called upon, to claim for the Army Veterinary Department a degree of recognition commensurate with the importance of their services in keeping remounts in a "fit" condition. Another department in which the veterinary profession demands the justice that has hitherto been denied is in regard to the inspection of meat. Most certainly the inspection of meat is a public duty which should by right be entrusted to the qualified veterinarian instead of being entrusted to "the plumber, the gasfitter, and the retired policeman." In the great duty also of safeguarding our flocks and herds and studs against contagious disease, the Government has very unwisely alienated the sympathy of the veterinary profession by giving mostly all the appointments as travelling inspectors to naval and military men and other job-hunters who had no scientific or practical knowledge whatever of live stock or live stock diseases. Another very grave mistake was the re-

ducing of the Veterinary Department of the Board of Agriculture to a subordinate position called "the Animals Division," and the further appointment of a military officer as the head of that "Animals Division." The greatest service which the Board of Agriculture can render—or, at least, has yet rendered—to the country is the stamping out, and guarding against the reintroduction of, contagious disease. In the prosecution of this great and beneficial work, the services of the veterinary profession are of incalculable value, and are, in fact, indispensable. And yet the Veterinary Department of the Board of Agriculture is not even called by that name, but is called "the Animals Division," and is presided over by a military officer who makes no pretensions to having any knowledge of veterinary science.—*North British Agriculturist.*

CATTLE PRACTICE IN IRELAND.

Dublin has been the venue of the annual conference and excursion of the National Veterinary Association of Great Britain. The presence in the Irish capital of so many members of the veterinary profession acquires a special significance at the present juncture by reason of the fact that, in the course of the next few weeks the doors of our new veterinary college will be thrown open for the first time. During the three days over which the proceedings of this Veterinary Conference have extended, numbers of papers have been read, and many matters of interest to the profession have been discussed, and no one in perusing the reports of the various meetings as published in the daily papers can fail to have been struck with the great prominence accorded in all the debates and discussions to the horse and equine matters, and the correspondingly small share of attention devoted to questions bearing upon the welfare in health and disease of the other animals of the farm.

This is not the first occasion upon which this circumstance has been commented upon. For years it has been a subject of general complaint among Irish stockowners that veterinary surgeons devote too much attention to the horse and too little to cattle, sheep, and pigs, with the result that when one of them, who may be *au fait* as an authority on equine ailments, is called in to deal with a case of sickness in any other farm animal he very often proves of but little more assistance than an ordinarily intelligent but quite unlearned and uncertificated cattleman. Important though our great industry of horse breeding is to the country at large, our cattle breeding, our sheep breeding, and our pig breeding industries are of still greater moment, and in the interests of the many who depend for such a large portion of their livelihood upon the welfare of our flocks and herds, it is to be hoped that in the future our good friends the vets. will give sheep and cattle ailments a little more of their time, and thought, and attention. It is to be hoped, too, that Professor Mettam, and those who are to be associated with him in the conduct of the new Irish Veterinary College, will impress upon their students the importance of devoting more attention to sheep and cattle ailments than has been done by veterinary pupils in the past.—*The Farmers' Gazette.*

ARMY HORSES.

I am already often asked, and I shall in all probability be still more often asked when I arrive home, which of the many varieties of horses employed did their work best in the campaign. On this head I have to go upon the reports of many others as well as what I saw for myself. My own opinion is still that, *ceteris paribus*, English horses can prove themselves in South Africa, as everywhere else, better than any others. But then these other things have not in the war been at all equal for them. They have mostly been called upon to make extraordinary exertions when unfit and unacclimatised, and in all cases they have had to go to work after a debilitating voyage and a prolonged and most trying railway journey. The English "bussers," by common consent, performed their part admirably as heavy artillery horses—a fact which, apart from the merit of the stamp supplied, must, no doubt, be attributed in a great measure to the splendid condition in which they had long been kept at home, and which they mostly contrived to maintain on the way out. The latter consignments, be it remembered, were not only better material, but they were shipped from England at a far less trying time than those that preceded them during the winter. They were also, it must be allowed, right well cared for on board ship.

The Australian and New Zealand horses have not been the conspicuous success in the war that we all rather expected they would be. As a rule they survived their voyage well, but soon afterwards would develop an obstinate catarrh, of which it was most difficult to cure them. Thus, many were found at first incapable of a campaign, and had to be nursed for a considerable time at remount farms or in the sick lines of the depôts. Yet we know well their staying powers and their capacity for long journeys in a hot climate. So these, too, should be most valuable remounts, could they have but a year in which to acclimatise.

An immense number of good horses will be left in South Africa after the war. At present it is, I fancy, hardly decided how to dispose of the thousands which our troops are likely to leave behind – for it is not contemplated, we are given to understand, to bring any number of them back to England. The mares will certainly remain in the country, and when we find we can spare them there will be vivid competition for them, whether among the old settlers or the new. A full supply of remount geldings, to last over some few years, will probably be retained for the use of the large body of mounted troops we shall certainly have to leave behind. After these are done with, I for one sincerely hope to see all such troops in South Africa mounted upon Colonial-bred horses—by which, of course, I include the produce of the late Orange Free State. Encouragement to breed animals of substance is what our Govesnment should provide the farmers Remounts of good type, and at a very accommodating price, will then speedily be forthcoming in ample quantities. £15 to £20 a head should then suffice to mount our men excellently on most active horses, bred and brought up in the country. As far as I can learn, the mounted branches of our services in South Africa are not likely again to be encumbered with such weight of arms and accoutrement as have made our cavalry a by-word for clumsiness of outfit and costliness of horseflesh. That the horses—or even ponies—of the country can get about in a campaign and carry at least a heavy man, together with rifle, great-coat, and blanket (which is about all that a mounted fighting man should need for personal baggage), has been amply shown by the Boers themselves. They are very big men, and they generally move at a gallop or hand-canter. Yet they have almost invariably eluded us by celerity of movement, and our best cavalry have scarcely ever been able to gallop them down in pursuit.

The Argentine cobs that have been imported into South Africa in such enormous numbers have been chiefly used for mounted infantry—though during about the middle of the campaign it became necessary to serve them out largely to our cavalry regiments. They have also been tried in small numbers for draught purposes—such as for drawing galloping Maxims. I am afraid the consensus of opinion among officers who have had most to do with them is against the Argentine pony as at present bred and presented for service. He is generally

pretty tractable to ride, when once mounted—to which, on first arrival, he is apt to evince some slight objection. But he is soft-hearted, and, when once tired, is apt to lay him down and die, without an effort. In harness, again, he is likely to give up trying as soon as it occurs to him that he has done enough. You have only to notice the sour and heavy heads which adorn the Argentine pony of the war of 1900 to understand at once that the fault lies in his breeding. The Argentine cobs in the campaign were also very much inclined to go wrong in their feet when put into work—though this may to some extent have been attributable to long voyage, close crowding on board, and sudden journeys after landing. Their percentage of mortality at sea was very slight, and they cost very little money—not much more than about £20, including passage over.

The Indian-bred horses stood the summer very well, and the winter very badly. They were for the most part in good condition when first landed, but the cold nights of the Orange River Colony tried them very severely. The American-bred horses were coming over from New Orleans in large numbers towards the wane of the war, looking admirably fitted for work, and probably suited to the climate—the States of America providing still greater extremes of heat and cold than is to be found on the highlands of South Africa. I heard of a shipload or more, of Hungarian horses, and of their being well approved by the regiments to whom they were served out. But they did not come under my personal observation. I think these are all the sorts of horses which combined to mount more men in South Africa, and had a higher death-roll than in any war of modern years. In summing up, I can only repeat myself to the effect that the horse of the country—if only he can be had in sufficient numbers, and of the better class, is far and away the most reliable. But all cavalry in Africa should be light cavalry, and all mounted infantry should be light men, with a light kit ; not giants in heavy marching order.—The Military Correspondent of *The Daily Telegraph*

THE CARBOLIC WAIL.

It is pitiful to observe the manner in which the "vested interests" of oilmen in the distribution of the arch-poison carbolic acid are being paraded before the public vision. Those who are crying out against the sale of the acid being entrusted to qualified persons are, we may charitably assume, ignorant of the fact that the principle of qualified supervision was determined by a Select Committee of the House of Commons as a necessary preliminary to controlling the sale of poisons. This was in 1865, and these provisions, as enacted in 1868, have been most beneficial to the public by keeping fatalities from scheduled poisons well under control. The case for scheduling carbolic acid has been forced upon the Privy Council, in association with two other Government Departments, by the power of public opinion as expressed by Coroners all over the country and by members of Parliament. The representatives of chemists and druggists in Great Britain—*i.e.*, the Pharmaceutical Council—have done anything but agitate about the matter, their exertions having been confined to the duty imposed upon them by Parliament. The stern reality of facts compelled action by these authorities, for the deaths from carbolic acid alone were almost as numerous as the fatalities from all the scheduled poisons put together. The latest returns of the Registrar-General for England and Wales show 206 deaths from carbolic acid in 1898, while all the scheduled poisons account for only 238 deaths. This is the best reply to the hysterical assertion that the scheduling of carbolic acid will limit its utility by restricting its sale to the authorised and educated retailers, because some of the scheduled poisons are as commonly used as carbolic acid, and the reason they are not so fatal is that their sale is so safeguarded as to minimise their use for felonious purposes as well as prevent the accidents which follow indiscriminate sale of lethal substances. This excellent result is entirely to the credit of registered chemists and druggists, and we claim for them that they have done splendid public service since the Pharmacy Act of 1868 was passed, by undertaking a duty which they did not seek, and which necessitates qualification by education and examination that has grown increasingly more difficult and expensive. We take it that the Privy Council was well aware of these facts when it invited the Pharmaceutical Council to pass the resolution which comes into force this day (September 1), and, although the wording of the resolution is far from being satisfactory, registered chemists and druggists will act up to it as honourably as they have done hitherto. One aspect of the oilmen's outcry deserves notice. It is said on their behalf that "the immediate effect of scheduling carbolic acid will be that where this valuable disinfectant is most needed—namely in the poorer and more crowded parts of our great cities—it will be used much more sparingly than hitherto. So that we are brought face to face with the possibility of an epidemic, because a few miserable wretches choose to take their own lives by means of the acid." The "few miserable wretches" in 1898 were 191 in England and Wales ; but would it be a calamity if the use of carbolic acid and its homologues were diminished ? We think not. The acid has become a popular disinfectant because it smells strong. As a bactericide it is comparatively feeble, and its use in the strong state is far from being the best method of disinfection. Many substances otherwise harmless are available for popular disinfection, and the effects of the scheduling will be to bring these into greater prominence. Already manufacturers show their ingenuity by producing disinfectants which are not "poison" in the legal sense, and we have no doubt that some of these will ere long meet with popular acceptance, so that the "penn'orth of carbolic" in a teacup will become a thing of the past, and the courts and alleys of our slums will remain as odorous as ever, while the fatalities from carbolic acid will greatly diminish. In this light—the proper view of the matter—the scheduling of the acid will be a veritable blessing. —*The Chemist and Druggist.*

The scheduling of carbolic acid continues to provide occupation for industrious persons who seem to doubt the capacity of the Council of the Pharmaceutical Society to conduct its business in a rational manner, the latest manifestation of misplaced ingenuity apparently having for its object the persuading of that body that certain non-poisonous bodies are now poisons within the meaning of the Pharmacy Act. As should now be known to everybody, liquid preparations of carbolic acid and its homologues are, with certain exceptions, now included in Schedule A, but some substances which are undoubtedly homologues of carbolic acid have not heretofore been credited with poisonous properties. Any ordinary person would naturally assume that, such being the case, preparations of those substances could not by any conceivable stretch of the imagination be regarded as scheduled poisons. Schedule A includes poisonous substances only and, though the word "poisonous" does not actually precede and qualify the word "homologues" in the resolution with has recently been approved by the Privy Council, it ought to be understood. Accordingly, there is not the least necessity, in this connection, for any learned displays of acquaintance with what "most text-books of organic chemistry" says about homologues, nor is there any occasion for alarm because thymol and carvacrol happen to be isomeric methyisopropyl phenols and, therefore, typical and well defined homologues of carbolic acid. Even if the wording of the resolution were held by the courts to cover non-poisonous homolo-

gues, there is still a fair amount of commonsense among the members of the body which is usually responsible for initiating proceedings under the Pharmacy Act. Moreover, the term "liquid preparations," may require interpretation. Are the oils of thyme and origanum—or even creosote, an undoubtedly poisonous article—liquid preparations of the phenols they contain?—*Pharmaceutical Journal.*

SOME ASPECTS OF BIOLOGY.

By Sir William Turner.

Abstract from the Presidential Address delivered at the meeting at Bradford, on Sept. 5th, 1900, of the British Association for the Advancement of Science.

The Cell Theory.

Down to the early part of this century but little more was known of the texture of the animal body than could be determined by the naked eye, assisted by a simple lens. Thus nerves, muscles, and tendons were known to be composed of fibres and blood—and lymph-vessels were known to be tubes. In 1830 Joseph Jackson Lister read a paper before the Royal Society upon the principles of the construction of achromatic object glasses for microscopes. One outcome of the increased penetrative powers of the microscope was Schwann's great cell theory, announced in 1839. The enunciation of the fundamental principle that the elementary tissues consisted of cells constituted a step in the progress of biological science which will ever stamp the century now drawing to a close with a character and renown equalling those which it has derived from the most brilliant discoveries in the physical sciences.

A cell is a living particle, so minute that it needs a microscope for its examination; it grows in size, maintains itself in a state of activity, responds to the action of stimuli, reproduces its kind, and in the course of time it degenerates and dies. Let us glance at the structure of a cell to determine its constituent parts and the rôle which each plays in the function to be discharged. The orlginal conception of a cell, based upon the study of the vegetable tissues, was a minute vesicle enclosed by a definite wall, which exercised chemical or metabolic change on the surrounding material and secreted into the vesicle its characteristic contents. A similar conception was at first also entertained regarding the cells of the animal tissues; but as observations multiplied it was seen that numerous elementary particles, which were obviously in their nature cells, did not possss an enclosing envelope. A wall ceased to have a primary value as a constituent part of a cell, the necessary vesicular character of which, therefore, could no longer be maintained. The other constituent parts of a cell are the cell plasm, which forms the body of the cell, and the nucleus embedded in its substance. Notwithstanding the very minute size of the nucleus, which even in the largest cells is not more than 1-500th in. in diameter, and usually is considerably smaller, its almost constant form, its well-defined sharp outline, and its power of resisting the action of strong reagents when applied to the cell, have from the period of its discovery by Robert Brown caused histologists to bestow on it much attention. Its structure and chemical composition; its mode of origin; the part which it plays in the formation of new cells, and its function in nutrition and secretion have been investigated. When examined under favourable conditions in its passive or resting state, the nucleus is seen to be bounded by a membrane which separates it from the cell plasm and gives it the characteristic sharp contour. It contains an apparently structureless nuclear substance, nucleoplasm or enchylema, in which are embedded one or more extremely minute particles called nucleoli, along with a network of exceedingly fine threads or fibres, which in the active living cell play an essential part in the production of new nuclei within the cell. In its chemical composition the nuclear substance consists of albuminous plastin and globulin and of a special material named nuclein, rich in phosphorus and with an acid reaction. The delicate network within the nucleus consists apparently of the nuclein, a substance which stains with carmine and other dyes, a property which enables the changes which take place in the network in the production of young cells to be more readily seen and followed out by the observer. The mode of origin of the nucleus and the part which it plays in the production of new cells have been the subject of much discussion. Schleiden, whose observations, published in 1838, were made on the cells of plants, believed that within the cell a nucleolus first appeared, and that around it molecules aggregated to form the nucleus. Schwann, again, whose observations were mostly made on the cells of animals, considered that an amorphous material existed in organised bodies, which he called "cytoblastema." It formed the contents of cells, or it might be situated free or external to them. He figuratively compared it to a mother liquor in which crystals are formed. Either in the cytoblastema within the cells or in that situated external to them, the aggregation of molecules around a nucleolus to form a nucleus might occur, and when once the nucleus had been formed in its turn it would serve as a centre of aggregation of additional molecules from which a new cell would be produced. He regarded, therefore, the formation of nuclei and cells as possible in two ways: one within pre-existing cells (endogenous cell-formation), the other in a free blastema lying external to cells (free cell formation). In animals, he says, the endogenous method is rare and the customary origin is in an external blastema. Both Schleiden and Schwann considered that after the cell was formed the nucleus had no permanent influence on the life of the cell and usually disappeared. Under the teaching principally of Henle, the famous professor of anotomy in Göttingen, the conception of the free formation of nuclei and cells in a more or less fluid blastema by an aggretation of elementary granules and molecules obtained so much credence, especially amongst those who were engaged in the study of pathological processes, that the origin of cells within pre-existing cells was to a large extent lost sight of. That a parent cell was requisite for the production of new cells seemed to many investigators to be no longer needed. Without doubt this conception of free cell-formation contributed in no small degree to the belief, entertained by various observers, that the simplest plants and animals might arise, without pre-existing parents, in organic fluids destitute of life, by a process of spontaneous generation—a belief which prevailed in many minds almost to the present day. If, as has been stated, the doctrine of abiogenesis cannot be experimentally refuted, on the other hand it has not been experimentally proved. The burden of proof lies with those who hold the doctrine, and the evidence that we possess is all the other way.

Apparently the first to recognise a multiplication of cells in plants by division, was von Mohl in 1835. Von Baer and others had recognised the germinal vesicle in the animal ovum before 1839 and Barry in 1839 and 1840 communicated two papers to the Royal Society describing the multipication of cells in or of the ovum.

John Goodsir and his brother Harry in 1842 and 1845 described the cleavage of cell nuclei and Remak, (1850-1855) confirmed the idea that the nucleus was the starting point for multiplication of cells. Finally Virchow in 1858 in his Cellular Pathology gave the death-blow to the theory of the free formation of cells in blastema and laid down his well-known formula, *Omnis cellula e cellulâ.*

Cell Plasm and Nucleus.

In the cells of plants, in addition to the cell wall, the

cell body and the cell juice require to be examined. The material of the cell body, or cell contents, was named by von Mohl (1846) "protoplasm," and consisted of a colourless tenacious substance which partly lined the cell wall (primordial utricle), and partly traversed the interior of the cell as delicate threads enclosing spaces (vacuoles) in which the cell juice was contained. In the protoplasm the nucleus was embedded. Nägeli, about the same time, had also recognised the difference between the protoplasm and the other contents of vegetable cells, and had noticed its nitrogenous composition. Though the analogy with a closed bladder or vesicle could no longer be sustained in the animal tissues the name "cell" continued to be retained for descriptive purposes and the body of the cell was spoken of as a more or less soft substance enclosing a nucleus (Leydig). In 1861 Max Schultze adopted for the substance forming the body of the animal cell the term "protoplasm." He defined a cell to be a particle of protoplasm in the substance of which a nucleus was situated. He regarded the protoplasm, as indeed had previously been pointed out by the botanist Unger, as essentially the same as the contractile sarcode which constitutes the body and pseudopodia of the amœba and other rhizopoda. As the term "protoplasm," as well as that of "bioplasm" employed by Lionel Beale in a somewhat similar though not precisely identical sense, involves certain theoretical views of the origin and function of the body of the cell it would be better to apply to it the more purely descriptive term "cytoplasm" or "cell plasm." Schultze defined protoplasm as a homogeneous, glassy, tenacious material, of a jelly-like or somewhat firmer consistency, in which numerous minute granules were embedded. He regarded it as the part of the cell especially endowed with vital energy, whilst the exact function of the nucleus could not be defined. Based upon this conception of the jelly-like character of protoplasm the idea for a time prevailed that a structureless, dimly granular jelly or slime destitute of organisation possessed great physiological activity and was the medium through which the phenomena of life were displayed.

More accurate conceptions of the nature of the cell plasm soon began to be entertained. Brücke recognised that the body of the cell was not simple but had a complex organisation. Flemming observed that the cell plasm contained extremely delicate threads which frequently formed a network the interspaces of which were occupied by a more homogeneous substance. Where the threads crossed each other granular particles (mikrosomen) were situated. Bütschli considered that he could recognise in the cell plasm a honeycomb-like appearance as if it consisted of excessively minute chambers in which a homogeneous more or less fluid material was contained. The polar and spindle-like radiations visible during the process of karyokinesis, which have already been referred to, and the presence of the centrosome, possibly even during the resting stage of the cell, furnished additional illustrations of differentiation within the cell plasm. In many cells there appears also to be a difference in the character of the cell plasm which immediately surrounds the nucleus and that which lies at and near the periphery of the cell. The peripheral part (ektoplasma) is more compact and gives a definite outline to the cell, although not necessarily differentiating into a cell membrane. The inner part (endoplasma) is softer, and is distinguished by a more distinct granular appearance, and by containing the products specially formed in each particular kind of cell during the nutritive process. By the researches of numerous investigators on the internal organisation of cells in plants and animals a large body of evidence has now been accumulated which shows that both the nucleus and the cell plasm consist of something more than a homogeneous, more or less viscid, slimy material. Recognisable objects in the form of granules, threads, or fibres can be distinguished in each. The cell plasm and the nucleus respectively are therefore not of the same constitution throughout but possess polymorphic characters the study of which in health and the changes produced by disease will for many years to come form important matters for investigation.

Nerve Cells.

In our endeavours to differentiate the function of the necleus from that of the cell plasm, we should not regard the former as concerned only in the production of young cells, and the latter as the exclusive agent in growth, nutrition, and, where gland cells are concerned, in the formation of their characteristic products. As regard cell reproduction also, though the process of division begins in the nucleus in its chromosome constituents, the achromatic figure in the cell plasm undoubtedly plays a part, and the cell plasm itself ultimately undergoes cleavage. A few years ago the tendency amongst biologists was to ignore or attach but little importance to the physiological use of the nucleus in the nucleated cell, and to regard the protoplasm as the essential and active constituent of living matter; so much so, indeed, was this the case that independent organisms regarded as distinct species were described as consisting of protoplasm destitute of a nucleus; also that scraps of protoplasm separated from larger nucleated masses could, when isolated, exhibit vital phenomena. There is reason to believe that a fragment of protoplasm, when isolated from the nucleus of a cell, though retaining its contractility and capable of nourishing itself for a short time, cannot increase in amount, act as a secreting structure, or reproduce its kind; it soon loses its activity, withers, and dies. In order that these qualities of living matter should be retained a nucleus is by most observers regarded as necessary (Nussbaum, Gruber, Haberlandt, Korschelt), and for the complete manifestation of vital activity both nucleus and cell plasm are required.

Bacteria.

The observations of Cohn, made about thirty years ago, and those of De Bary shortly afterwards, brought into notice a group of organisms to which the name "bacterium" or "microbe" is given. They were seen to vary in shape: some were rounded specks called cocci, others were straight rods called bacilli, others were curved or spiral rods, vibrios or spirillæ. All were characterised by their extreme minuteness, and required for their examination the highest powers of the best microscopes. Many bacteria measure in their least diameter not more than 1-25000th of an inch, 1-10th the diameter of a human white blood corpuscle. Through the researches of Pasteur, Lord Lister, Koch, and other observers bacteria have been shown to play an important part in nature. They exercise a very remarkable power over organic substances, especially those which are complex in chemical constitution, and can resolve them into simpler combinations. Owing to this property some bacteria are of great economic value and without their agency many of our industries could not be pursued; others again, and these are the most talked of, exercise a malign influence in the production of the most deadly diseases which afflict man and the domestic animals.

Great attention has been given to the structure of bacteria and to their mode of propagation. When examined in the living state and magnified about 2,000 times, a bacterium appears as a homogeneous particle, with a sharp definite outline, though a membranous envelope or wall, distinct from the body of the bacterium, cannot at first be recognised, but when treated with reagents a membranous envelope appears, the presence of which without doubt gives precision of form to the bacterium. The substance within the membrane contains granules which can be dyed with colouring agents. Owing to

their extreme minuteness it is difficult to pronounce an opinion on the nature of the chromatine granules and the substance in which they lie. Some observers regard them as nuclear material, invested by only a thin layer of protoplasm, on which view a bacterium would be a nucleated cell. Others consider the bacterium as formed of protoplasm containing granules capable of being coloured, which are a part of the protoplasm itself and not a nuclear substance. On the latter view bacteria would consist of cell plasm enclosed in a membrane and destitute of a nucleus. Whatever be the nature of the granule-containing material each bacterium is regarded as a cell, the minutest and simplest living particle capable of an independent existence that has yet been discovered. Bacteria cells, like cells generally, can reproduce their kind. They multiply by simple fission, probably with an ingrowth of the cell wall, but without the karyokinetic phenomena observed in nucleated cells. Each cell gives rise to two daughter cells, which may for a time remain attached to each other and form a cluster or a chain, or they may separate and become independent isolated cells. The multiplication, under favourable conditions of light, air, temperature, moisture, and food, goes on with extraordinary rapidity, so that in a few hours many thousand new individuals may arise from a parent bacterium.

Connected with the life-history of a bacterium cell is the formation in its substance, in many species and under certain conditions, of a highly refractile shiny particle called a "spore." At first sight a spore seems as if it were the nucleus of the bacterium cell, but it is not always present when multiplication by cleavage is taking place and when present it does not appear to take part in the fission. On the other hand, a spore, from the character of its envelope, possesses great power of resistance, so that dried bacteria, when placed in conditions favourable to germination, can through their spores germinate and resume an active existence. Spore formation seems, therefore, to be a provision for continuing the life of the bacterium under conditions which, if spores had not formed, would have been the cause of its death. The time has gone by to search for the origin of living organisms by a spontaneous aggregation of molecules in vegetable or other infusions, or from a layer of formless primordial slime diffused over the bed of the ocean. Living matter during our epoch has been, and continues to be, derived from pre-existing living matter, even when it possesses the simplicity of structure of a bacterium, and the morphological unit is the cell.

Heredity and Variation.

The morphological characters exhibited by a plant or animal tend to be hereditarily transmitted from parents to offspring and the species is perpetuated. In each species the evolution of an individual, through the developmental changes in the egg, follows the same lines in all the individuals of the same species which possess, therefore, in common the features called specific characters. The transmission of the characters is due, according to the theory of Weissmann, to certain properties possessed by the chromosome constituents of the segmentation nucleus in the fertilised ovum, named by him the germ plasm, which is continued from one generation to another and impresses its specific character on the egg and on the plant or animal developed from it. The special tissues which build up the bodies of the more complex organisms are evolved out of cells at first simple in form. During the evolution of the individual, cells become modified or differentiated in structure and function, and so long as the differentiation follows certain prescribed lines the morphological characters of the species are preserved. We can readily conceive that, as the process of specialisation is going on, modifications or variations in groups of cells and the tissues derived from them, notwithstanding the influence of heredity, may in an individual diverge so far from that which is characteristic of the species as to assume the arrangements found in another species, or even in another order. Anatomists had, indeed, long recognised that variations from the customary arrangement of parts occasionally appeared and they described such deviations from the current descriptions as irregularities.

The signification of the variations which arise in plants and animals had not been apprehended until a flood of light was thrown on the entire subject by the genius of Charles Darwin, who formulated the wide-reaching theory that variations could be transmitted by heredity to younger generations. In this manner he conceived new characters would arise, accumulate, and be perpetuated which would in the course of time assume specific importance. New species might thus be evolved out of organisms originally distinct from them, and their specific characters would in turn be transmitted to their descendants. By a continuance of this process new species would multiply in many directions, until at length from one or more originally simple forms the earth would become peopled by the infinite varieties of plant and animal organisms which have in past ages inhabited, or do at present inhabit, our globe. The Darwinian theory may therefore be defined as heredity modified and influenced by variability. It assumes that there is an heredity quality in the egg which, if we take the common fowl for an example, shall continue to produce similar fowls. Under conditions, of which we are ignorant, which occasion molecular changes in the cells and tissues of the developing egg, variations might arise in the first instance probably slight, but becoming intensified in successive generations until at length the descendants would have lost the characters of the fowl and would have become another species. No precise estimate has been arrived at, and, indeed, one does not see how it is possible to obtain it, of the length of years which might be required to convert a variation capable of being transmitted into a new and definite specific character.

The circumstances which according to the Darwinian theory determined the perpetuation by hereditary transmission of a variety and its assumption of a specific character depended, it was argued, on whether it possessed such properties as enabled the plant or animal in which it appeared to adapt itself more readily to its environment—*i.e.*, to the surrounding conditions. If it were to be of use the organism in so far became better adapted to hold its own in the struggle for existence with its fellows and with the forces of nature operating on it. Through the accumulation of useful characters the specific variety was perpetuated by natural selection so long as the conditions were favourable for its existence and it survived as being the best fitted to live. In the study of the transmission of variations which may arise in the course of development it should not be too exclusively thought that only those variations are likely to be preserved which can be of service during the life of the individual, or in the perpetuation of the species, and possibly available for the evolution of new species. It should also be kept in mind that morphological characters can be transmitted by hereditary descent, which, though doubtless of service in some bygone ancestor, are in the new conditions of life of the species of no physiological value. Our knowledge of the structural and functional modifications to be found in the human body, in connexion with abnormalties and with tendencies or predisposition to diseases of various kinds, teaches us that characters which are of no use, and, indeed, detrimental to the individual, may be hereditarily transmitted from parents to offspring through a succession of generations.

Evolution.

Since the conception of the possibilty of the evolution

of new species from pre-existing forms took possession of the minds of naturalists, attempts have been made to trace out the lines on which it has proceeded. The first to give a systematic account of what he conceived to be the order of succession in the evolution of animals was Ernst Haeckel of Jena, in a well-known treatise. Memoirs on special departments of the subjects, too numerous to particularise, have subsequently appeared. The problem has been attacked along two different lines: the one by embryologists, of whom may be named Kowalewsky, Gegenbaur, Dohrn, Ray Lankester, Balfour, and Gaskell, who with many others have conducted careful and methodical inquiries into the stages of development of numerous forms belonging to the two great divisions of the animal kingdom. Invertebrates, as well as vertebrates, have been carefully compared with each other in the bearing of their development and structure on their affinities and descent, and the possible sequence in the evolution of the vertebrata from the invertebrata has been discussed. The other method pursued by palæontologists, of whom Huxley, Marsh, Cope, Osborne, and Traquair are prominent authorities, has been the study of the extinct forms preserved in the rocks and the comparison of their structure with each other and with that of existing organisms. In the attempts to trace the line of descent the imagination has not infrequently been called into play in constructing various conflicting hypotheses. Though from the nature of things the order of descent is, and without doubt will continue to be, ever a matter of speculation and not of demonstration, the study of the subject has been a valuable intellectual exercise and a powerful stimulant to research.

We know not as regards the time when the fiat went forth, "Let there be Life, and there was Life." All we can say is that it must have been in the far-distant past, at a period so remote from the present that the mind fails to grasp the duration of the interval. Prior to its genesis our earth consisted of barren rock and desolate ocean. When matter became endowed with life, with the capacity of self-maintenance and of resisting external distintegrating forces, the face of nature began to undergo a momentous change. Living organisms multiplied, the land became covered with vegetation, and multitudinous varieties of plants, from the humble fungus and moss to the stately palm and oak, beautified its surface and fitted it to sustain higher kinds of living beings. Animal forms appeared, in the first instance simple in structure, to be followed by others more complex, until the mammalian type was produced. The ocean also became peopled with plant and animal organisms, from the microscopic diatom to the huge leviathan. Plants and animals acted and reacted on each other, on the atmosphere which surrounded them, and on the earth on which they dwelt, the surface of which became modified in character and aspect. At last man came into existence. His nerve-energy, in addition to regulating the processes in his economy which he possesses in common with animals, was endowed with higher powers. When translated into psychical activity it has enabled him throughout the ages to progress from the condition of a rude savage to an advanced stage of civilisation; to produce works in literature, art, and the moral sciences which have exerted, and must continue to exert, a lasting influence on the development of his higher being; to make discoveries in physical science; to acquire a knowledge of the structure of the earth, of the ocean in its changing aspects, of the atmosphere and the stellar universe, of the chemical composition and physical properties of matter in its various forms, and to analyse, comprehend, and subdue the forces of nature. By the application of these discoveries to his own purposes man has, to a large extent, overcome time and space: he has studded the ocean with steamships, girdled the earth with the electric wire, tunnelled the lofty Alps, spanned the Forth with a bridge of steel, invented machines and founded industries of all kinds for the promotion of his material welfare, elaborated systems of government fitted for the management of great communities, formulated economic principles, obtained an insight into the laws of health, the causes of infective diseases, and the means of controlling and preventing them.

When we reflect that many of the most important discoveries in abstract science and in its applications have been made during the present century, and indeed since the British Association held its first meeting in the ancient capital of your county 69 years ago, we may look forward with confidence to the future. Every advance in science provides a fresh platform from which a new start can be made. The human intellect is still in process of evolution. The power of application and of concentration of thought for the elucidation of scientific problems is by no means exhausted. In science is no hereditary aristocracy. The army of workers is recruited from all classes. The natural ambition of even the private in the ranks to maintain and increase the reputation of the branch of knowledge which he cultivates affords an ample guarantee that the march of science is ever onwards, and justifies us in proclaiming for the next century, as in the one fast ebbing to a close, that great is science and it will prevail.—*The Lancet.*

DR. SEDGWICK SAUNDERS AND THE INSPECTION AND SEIZURE OF MEAT.

To the Editor "Meat Trades' Journal."

Sir,—In the *Meat Trades' Journal* of August 30th, there appears, under the above heading, a column of what professes to be an extract from the annual Report of the Medical officer of Health to the Corporation of London. It is not printed with quotation marks. This, together with the extraordinary nature of the statements made, and the mode in which some of them are formulated, makes one disposed to disbelieve that they could have been penned by the Medical Officer, or have been intended by him to be printed in a document so important as his Annual Report to the Corporation of London, the greatest city in the world. Surely there, if anywhere, one might anticipate sound and reasonable consideration of facts, judicious statements, and the very best representation of the scientific results acquired up to date on the subject discussed. Yet what do we find? The extract in question consists of the wildest and most ludicrous mistakes of language and fact, the most reckless opinions and crude conclusions, and the most unwarranted assumptions which can be found combined in any similar production. Dr. Sedgwick Saunders has enjoyed a reputation not unfitting the great office he holds. One can only conclude, therefore, that the passage in question, dealing with the inspection and seizure of meat, was written out in the rough by some young clerk or type-writer, and was printed in the Medical Officer's Report by an oversight. But as it appears in his Report, and with his authority, it calls for comment, and I hope your readers will take the trouble to give some attention to the subject.

It is in dealing with the question of eating meat from animals which had suffered from localised tuberculosis that the author of the extract from the Annual Report of the Medical Officer of the City of London—I will not assume he was Dr. Sedgwick Saunders himself, he could not write such stuff—is at his best.

Here is a verbatim extract—unequalled for obliviousness of the most familiar scientific facts, and for unworthy insinuation of corrupt motives, in any work bearing the name of an author of repute, or of any respectable public body. He writes: "Unfortunately, there is a

tendency on the part of *interested* persons to dispute the conclusions arrived at with respect to the sale of meat from a tuberculous animal that may have been slaughtered before the *general mass of muscular tissue* has become involved." The person writing under Dr. Saunders' name is obviously ignorant of the fact that the general mass of muscular tissue (*i.e.*, the lean) is never involved, but that while the tubercular lesions are localised elsewhere the meat is perfectly sound and good. In the opinion of all competent authorities on the subject, such meat should be passed by all inspectors as fit for human food. This is the opinion of the Royal Commission on Tuberculosis, this is the opinion of the Local Government Board, and this is the opinion of almost every Medical Officer of Health in the kingdom, as it is the general rule throughout this country to pass such meat, and there is no country where the practice is different from this. The writer in Dr. Saunders' Report refers to a contrary opinion expressed by some unnamed Congress of Paris in 1888. Surely he does not mean to bow to a decision of the Veterinary Congress of that year, as he only mentions veterinary surgeons in order to throw contempt on them. But having quoted the resolution of some unnamed Congress, why does he not in fairness quote also the fact that no such resolution condemning the use of meat from animals with localised tuberculosis was ever approved by the French Government, or by any Government? Why does he not in fairness quote the opinions of Veterinary Congresses which have expressed the opinion that such meat is perfectly wholesome? Why does he not tell the Corporation of London that the Local Government Board has issued regulations to sanitary authorities which deelare such meat is wholesome, and consider that Medical Officers condemning it act improperly? Why is all this suppressed, and the Corporation of London only informed of a resolution passed by a Congress in 1888, the name of which is concealed? The reader will answer this question for himself. Much has been done since 1888 on the subject, though it may be unknown to the writer in Dr. Saunders' Report.

But, says the report of Dr. Saunders, "No competent pathologist would dare to assert that when pathogenic micro-organisms have once entered the body of an animal, one part of its anatomy (the muscles) is free from infection, and another part (the viscera) infected: the force of absurdity can go no further than this!" Anatomy is the science and art of dissection. How can a muscle be part of a science? The expression is nonsense.

It is known to every student of pathology that "pathogenic micro-organisms" may, and usually do, enter the body and breed in a particular spot only, while the rest of the animal's body—the whole of it except the mere local sore—remains free from infection. For instance, the micro-organism of anthrax may be inoculated on a man, and may produce a sore which is entirely local, the micro-organisms not invading the rest of the body beyond the sore. If a number of dogs be inoculated with rabies in the end of the tail, and one of them be killed after three or four days, the infection will be found to have travelled up the nerves to a certain point, while, beyond that the tissues are free from infection. If another of the dogs be killed a day later, the infection will be found to have gone a little farther, and so on day by day until the brain is reached, and the dog becomes rabid. The disease, at first localised in the tip of the tail, extends gradually, and can be tracked in its progress until it reaches the brain, shortly after which the animal dies. The microbe of tubercle, when inoculated on a man (say a slaughterman's hand), remains confined to the spot for a very long time, it may be years, and it may die out at the spot without extending any farther. One small gland in a body may contain tubercle bacilli, and the rest of the body be perfectly free. One joint of a man may be tuberculous, and the man may be completely cured by operation, which would be impossible if the man were tuberculous everywhere, as well as in the joint. If he were tuberculous everywhere, he must inevitably die—such "generalised tuberculosis" being necessarily fatal; when the disease is "localised," as in the joint, the patient may recover, and thousands do so every year, because the rest of the body is free from infection. This is a mere statement of familiar facts known and indisputable.

The writer in Dr. Saunders' Report, with characteristic assumption of the truth of what is not the fact, says that "any person, irrespective of rank, attempting to poison the public with such stuff will be prosecuted and rendered liable to fine and imprisonment." Here the ingenuous writer assumes that such meat is "poisonous," and that the seller is guilty of "attempting to poison." This is going rather fast, and the language is a trifle violent.

But what about "the poison?" The experiments performed for the information of the Royal Commission by Professor Sydney Martin, proved that such meat is entirely harmless; and the Royal Commission believed Dr. Martin, and accordingly pronounced it sound and good. The writer of Dr. Saunders' Report says it is "poison." Whom will you believe? The experiments of Martin established nothing new; he only repeated what had been established long before by Koch, Baumgarten, Nocard, and a crowd of other recognised authorities. Are they all wrong, and is the writer of Dr. Saunders' report right?

This curious extract from Dr. Saunders' report ends with a reiterated attack on veterinary surgeons, "the training and education of its votaries," it says, afford no justification for the assumption of opinions antagonistic to the experience of the practical physician." Elsewhere, it protested against any appeal from the judgment of Medical Officers of Health. Has he heard of the carcases wrongly condemned for tuberculosis by the medical officers of St. Pancras and Scarborough? Here he drags in the "practical physician" as the judge. But are they the best judges; and if so where and when have they given their decision? Nowhere, so far as I know, except in the Académie de Médecine in Paris. There, after a long debate as to whether the administration of raw meat (which is not uncommon in France) might not entail a danger of tuberculosis, the "practical physicians," including some of the most eminent in France, or in any country, decided that there was no such danger. But, of course, the writer of Dr. Saunders' report, without warrant assumes, that the "practical physician" holds the same view as himself, and does not scruple to try and make others believe it. This unwarrantable assumption of the truth of utterly unfounded facts occurs frequently in this writer's report, and calls for strong protest. Nothing can be more unjustifiable than such a mode of writing, *e.g.* calling meat, the sale of which is sanctioned by the Local Government Board, "poison," insinuating that "the largest municipalities at home and abroad" have adopted the plan he advocates, whereas the contrary is the fact, &c. &c. With regard to the assumed want of education of veterinary surgeons on the subject of tuberculosis, may I venture to ask if he has ever heard of the renowned pathologist Chauveau, the not unworthy successor of Claude Bernard, as Professor of Physiology in the University of France? That eminent man is only a veterinary surgeon, and his lectures and experiments have been carried out mainly in teaching young veterinary surgeons. Is the name of Professor McFadyean, perhaps the ablest pathologist in Great Britain, unknown to him? It was known to the Royal Commission on Tuberculosis, who employed him to perform experiments for their instruction. Professor McFadyean is a veterinary surgeon, and is engaged in educating veterinary surgeons. Are Williams, of Edinburgh, and McCall, of Glasgow, unknown and uneducated creatures? They, too, are mere vets. Shall I men-

tion the celebrated Professor Bouley, or Nocard, or Schutz, of Berlin ; or Bollinger, of Munich ; or Perroncito, of Turin ; or Ostertag, of Berlin ; or Bang, of Copenhagen ; or Johne, of Dresden ; or Toussaint, Arloing, Cornevin, or Thomas ? All these are most eminent pathologists, to whom we owe so much of our knowledge of tuberculosis and other infectious diseases, and yet are among those despicable veterinary surgeons, whose opinions are scorned in Dr. Saunders' report—the same report which declares that it is the *ne plus ultra* of absurdity to say a pathogenic organism may be present in one part of the body, while the rest of the body is unaffected ; and calls meat "poison," if it is from an animal which had localised tuberculosis—though such meat is pronounced wholesome by every Government in the world !

The opinion of a meat inspector, who before his appointment was a bricklayer or a joiner, is sufficient to decide as to the wholesomeness of meat, while that of a veterinary surgeon, who must be trained in the diseases of animals, is to be held as contemptible, unless he is an official !

With this statement of facts I leave your readers to pronounce judgment on the knowledge of the subject displayed by Dr. Saunders' report, and of the judgment and prudence of the writer who flings charges of being "interested" and ignorant against the teachers and professors of modern pathology and veterinary science, who happen to disagree with him, he being the champion of the immutable pathology of Hippocrates, while they are the pillars of modern science. Possibly, the most appropriate treatment would have been to disregard the report as being unworthy of serious notice ; but the important position of its author is calculated to give it a weight to which otherwise it is not in any way entitled. There are many persons not acquainted with the facts who would naturally imagine that the report of the Medical Officer of the Corporation of London must be a reliable source of information, and who would accept without question the statements in it as being correct. I trust this letter of mine may fall into the hands of such persons, and I leave the consideration of its contents confidently to them.—Yours, &c.,

THOS. WHITESIDE HIME.

Bradford, 8th Sept.

DRAUGHT HORSE BREEDING AND VETERINARY INSPECTION.

Whilst admitting the ability of the modern veterinary surgeon to cure, there is a very large section of the public that will not allow him a right to teach outside of the class-room. His very best friend at times will ignore his advice when he tells him that a certain horse or mare he means to breed from has a disease which is hereditary, and that it is almost sure to crop out in the progeny. Fortunately, owing to a wider diffusion of knowledge through stock journals, stud books, lectures at club meetings, and the like, such friends are every day getting fewer.

In regard to the veterinary surgeon's appearances outside of his curing functions, his position up till the last twenty years, or, indeed, till the early days of the Shire Horse Society's Show, seems to have been that of an expert in the witness box. If he was allowed to travel away from any particular horse in dispute, it was usually to give it as his opinion that such and such a disease was hereditary. Possibly breeders of extensive experience, having passed several generations of the same family of stock through their hands, would be much better able to speak of heredity than he could ; but it is the custom in law courts to give more weight to the trained expert, to the professional man, however youthful, than to untrained knowledge from any quarter. In building up families of superior work horses, having weight and wearing qualities of limbs and hoofs, wedded to sound constitutions, the Society mentioned very early perceived that no beauty of form, no flatness of bone, no silkiness of feather, and no gaiety of action could profitably be gained at the expense of some disease which lurked unseen. They recognised in the captivation of the unsound stallion a serious evil. Knowing how much he was likely to receive patronage on the mere strength of looks, they straightway sent him to sea.

That the veterinary inspection at the Islington meeting is a very hard mill to go through, owners of stallions at any rate have fairly well learned by this time. There are, of course, some who possess stallions and do not exhibit at the Society's meeting, who pooh-pooh the veterinary business in its entirety. Such men are most unfortunately backed in a few unenlightened corners of the land by those whose prejudice against the profession is far in excess of their intelligence. One cannot possibly expect much, of course, from people who may confess to the opinion that a peculiar physical feature, it may be an angular nose or a prominent chin, comes from a grandfather, but do not consider that the influence of heredity extends any further. As a matter of fact, there is very little, be it weak or strong in man or horse, that is not affected by heredity. Without recognising special weaknesses, but only the general question, it is plain that very serious responsibilities attach to the action of veterinary surgeons who examine horses which have to go out and propagate their species. Perhaps if the gelding supply alone were considered, more importance attaches to the granting of certificates of soundness than the award of honour by the judges. Dealers with commissions from large brewery firms to execute know that if they submit for inspection and trial many horses which have to be rejected as unsound they might very soon receive the signal to stay away. In the very old days they ran the risk of this ; but now, when buying, they very soon get to learn where certain good sound horses have been for some seasons at work, and, on the other hand, where at cheap fees as usual sires have been serving which are absolutely full of hereditary infirmities. There is unfortunately no compulsory way of putting the latter off the road ; they must simply be shoved aside by certificated stallions and the common-sense and enterprise of the farmers who own mares. Every means should be taken to notify the fact that certificated horses are travelling, and ask breeders to beware of all others. Of course a horse may get a veterinary certificate when a four-year-old, yet fail to pass the same tribunal two years afterwards. It might be fair, therefore to allow a horse two full seasons of travel on his original veterinary ticket, and, if possible, let this ticket be endorsed for another two years by approved local veterinary surgeons acting under the Shire Horse Society, thus avoiding the expense incurred in bringing the horse to London, where as yet no proper hiring system has been developed which would give him a chance of a yearly market. Breeders are now fairly well up in what constitute the essential points in draught horses, and they are in every way fortified with accurate Stud Book pedigrees, not to mention a large amount of useful photographic portraiture, a form of guidance unknown to their forefathers. It should be the aim now in every quarter to stamp out every form of hereditary unsoundness.—*Live Stock Journal.*

Veterinary Surgeon to the Queen at Windsor.

The Daily Graphic says :—

In many obituary notices of the late Sir Henry Lunnon Simpson he was described as Veterinary Surgeon to the Queen at Windsor. This is incorrect. The appointment which Sir Henry held was that of Veterinary Surgeon to the Queen's Buckhounds, at Ascot. The Veterinary to the Queen at Windsor is Mr. R. C. Tennant, who was appointed last year on the retirement of his predecessor and partner, Mr. Henry Allnut, M.R.C.V.S,, who had held the appointment for upwards of twenty-four years, and who, for a still longer period, had been sole veterinary surgeon at the Royal farms, gardens, and dairy.

No Politics.

They carry politics to a great extreme in Ireland. An Irish paper last week in publishing some reports on the Irish crops reminds its readers that it has always been non-political, and that no political significance is to be attached to the said reports.

The Sanitary Institute.

PARKES MUSEUM, MARGARET STREET, LONDON, W.

The Council of the Institute have arranged the following examinations for Inspectors of meat and other foods during 1901 :—

Birmingham—March 29th and 30th.
London—May 3rd and 4th.
Liverpool—July 19th and 20th.
London—December 6th and 7th.

Personal.

SPOONER.—On the 11th inst., at P. House, The Camp, Woolwich, the wife of Major W. B. Spooner, A.V.D., of a daughter.

ARMY VETERINARY DEPARTMENT.

C.V.S. J. Wilson Barker left Cape Town for England in ss. Custodian.

CORRESPONDENCE.

"LET RIGHT BE DONE."

Sir,

Can you suggest any way by which our Council will be compelled to re-hear the Cambridge case? What I cannot understand is, that a man of Professor John Penberthy's position in the profession can allow the facts mentioned two months ago to be unanswered. Could you tell us through your journal who supported Professor Penberthy when this case was brought before the Council? The profession seems to be more or less in a moribund condition, perhaps if you could let us have the names of these enlightened members all in a row it would have the same effect as the kiss to the sleeping beauty of our boyhood days. I do not say that these men who followed the Professor's lead are wrong, it may be that I am wrong. In these matters I do not know that there is any exact law to follow or guide us in forming our opinion. The best guide that I know is to consider how one would like an irregular action done to oneself. Further consider is this action one that we would do, and afterwards admit of it?

Did our learned Council consider this case after the above fashion? This I cannot for one moment believe. It does seem strange that men should fail to find fault with what now seems from the article signed "Let Right be Done" a most glaring case of unprofessional conduct. Did they approve of defendant's action, and could they say it was an action they would have submitted to had they been the sufferer? There may be something behind this case that the rank and file of the profession cannot perceive. If this is so, why this appalling silence? Some may call it preserving their dignity, but surely the electors might receive a dignified reply when the matter affects the status of the Council so closely. Is this a conspiracy of silence, or are those who voted in the majority ashamed of their action? I humbly pray to those who voted in the minority to band together and have this case re-opened. Let it be heard with open doors, give the defender and his advocates every chance, and for those of us who live miles from Red Lion Square I request of you, sir, a full report for all parties. There may be an explanation, and I am sure if they give it you will publish it in full, after giving the appelant's case to such length some two months ago.

If this case is allowed to drop, my fondest hope will be that some day one of the majority will appeal to a future council and get similar treatment.—Yours, etc.,

A NORTH COUNTRYMAN.

"DISGRACEFUL CONDUCT."

Sir,

May I trouble you or some of your many readers for answers to the following questions?—

1. Is it considered proper for one practitioner to call in and see another practitioner's case, whilst the latter is attending it, especially when not asked to do so by the owner?
2. If he does so ought he to give any opinion on the treatment being pursued by the attending practitioner?
3. If he does, is such conduct disgraceful in a professional respect?
4. Should such a case be brought before the Registration Committee?
5. If it were, what ought to be the result if they found it true?

I am anxious to have answers from an older head than my own on these points, as I am a young practitioner and am desirous of doing what is right, hence my appeal to you and your readers.—Yours truly,

M.R.C.V.S.

COMMUNICATIONS, BOOKS, AND PAPERS RECEIVED—Messrs. G. Mayall, A. S. Hodgkins, Lt. Col. Nunn. "A Nortl. Countryman."

Paisley Daily Express.

We shall be obliged by early intelligence of all matters worth bringing under the notice of the profession, and thankful to any friends who may send us cuttings from local papers containing facts of interest.

Original articles and reports should be written on one side only of the paper and authenticated by the names and addresses of the writers, not necessarily for publication.

Communications for the Editor to be addressed 20 Fulham Road, S.W.